



## **Access to electricity in rural Africa - from donor support to innovative business models**

**Nygaard, Ivan; Hansen, Ulrich Elmer; Larsen, Thomas Hebo**

*Published in:*  
Book of Abstracts, Sustain 2017

*Publication date:*  
2017

*Document Version*  
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

*Citation (APA):*  
Nygaard, I., Hansen, U. E., & Larsen, T. H. (2017). Access to electricity in rural Africa - from donor support to innovative business models. In *Book of Abstracts, Sustain 2017* [G-5] Technical University of Denmark.

---

### **General rights**

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

## Access to electricity in rural Africa - from donor support to innovative business models

Ivan Nygaard <sup>\* 1)</sup>, Ulrich Elmer Hansen <sup>1)</sup>, Thomas Hebo Larsen <sup>1)</sup>

<sup>1)</sup> UNEP DTU Partnership, DTU Management Engineering, DTU

<sup>\*\*</sup> Corresponding author email: [ivny@dtu.dk](mailto:ivny@dtu.dk)

The traditional model of rural electrification in Sub-Saharan Africa (SSA) mainly involves donor and government-supported programs. Recently, however, a rapid and significant increase has occurred in the sale of pico-scale solar products throughout SSA. This development is driven by an increasing number of private firms supplying pico-scale solar systems to customers, on a commercial basis, in order to serve their electricity and lighting needs. The system suppliers take advantage of the substantial improvement in the price and efficiency of core technology components, the emergence of smart metering technologies, and the wide spread use of mobile phones and mobile payment schemes. Suppliers are, thus, able to target poor customers located mainly in off-grid, rural areas through new pay-as-you-go business models that avoid high upfront costs. With the parallel rise in the costs of conventional sources of electricity and lighting, especially diesel and kerosene, the demand for pico-scale solar appliances has boomed. These factors are driving a remarkable and unprecedented diffusion of pico-scale solar PV products on market terms, which stands in contrast to the donor and government-driven model of rural electrification

### References

- Alstone, P., Gershenson, D., Turman-Bryant, N., Kammen, D.M., Jacobson, A., 2015. Off - Grid Power and Connectivity - Pay -As - You-Go financing and digital supply chains for pico-solar. University of California, Berkeley and Lighting Global.
- Diecker, J., Wheeldon, S., Scott, A., 2016. Accelerating access to electricity in Africa with off-grid solar: Policies to expand the market for solar household solutions. Overseas Development Institute.
- Hansen, U.E., Pedersen, M.B., Nygaard, I., 2015. Review of Solar PV market development in East Africa. *Renew. Sustain. Energy Rev.* 46, 236–248. doi:10.1016/j.rser.2015.02.046
- Lee, K., Brewer, E., Christiano, C., Meyo, F., Miguel, E., Podolsky, M., Rosa, J., Wolfram, C., 2016. Electrification for “under Grid” households in Rural Kenya. *Dev. Eng.* 1, 26–35. doi:10.1016/j.deveng.2015.12.001
- MoEP, 2016. Current activities and challenges to scaling up mini-grids in kenya. Ministry of Energy and Petroleum, Kenya and ESMAP, World Bank
- Nygaard, I., 2009. Compatibility of rural electrification and promotion of low-carbon technologies in development countries: The case of Solar PV for Sub-Saharan Africa. *Eur. Rev. Energy Mark.* 3, 125–158.
- Orlandi, I., Tyabji, N., Chase, J., 2016. Off-grid solar market trends report 2016. Bloomberg New Energy Finance, World Bank, IFC and Global Off-grid Lighting Association. doi:10.1017/CBO9781107415324.004
- Pedersen, MB, 2017, Rural electrification through private models: the case of solar-powered mini-grid development in Kenya: Exploring the hybrid nature of private business models and the interplay between new players and existing structures in the Kenyan rural electrification regime. Ph.D. thesis. UNEP DTU Partnership
- Rolffs, P., Ockwell, D., Byrne, R., 2015. Beyond technology and finance: pay-as-you-go sustainable energy access and theories of social change. *Environ. Plan. A* 47, 2609–2627. doi:10.1177/0308518X15615368
- Scott, A., Miller, C., 2016. Accelerating access to electricity in Africa with off - grid solar: The market for solar household solutions. Overseas Development Institute.